



VCA Oso Creek Animal Hospital

Corpus Christi, Texas

**Beta Trial Results,
Revenue Projections and
Case Studies of Animal Wound Therapy
Using the PLASON Nitric Oxide Device**

2/25/2010 – 8/9/2010

Scott Vaughan, DVM – Medical Director

Pam Pruitt, DVM – Beta Trial Supervisor

Background

VCA Oso Creek Animal Hospital participated with Plasma Technologies, Inc. in a beta trial of PTI's PLASON Nitric Oxide Plasma Therapy Device for a period of approximately 5 ½ months beginning February 25, 2010 for the purpose of evaluating the efficacy of its therapeutic benefits in wound healing and osteoarthritis conditions in small animals. The PLASON device was used on a variety of conditions during the course of the beta trial, and six documented case studies are included in this report. Based on the use of the device, the supporting science, the projected revenues to the practice and the results of the case studies, VCA Oso Creek Animal Hospital has recommended the purchase of the Plason device.

Healing Mechanism and Supporting Science

Nitric Oxide (NO) is a free radical synthesized by the Nitric Oxide Synthase (NOS) of humans and animals in response to traumatic wounds and inflammation. The discoverers of its role in mediating healing were awarded the Nobel Prize in 1998. The PLASON device was developed by scientists working for the Baumann Institute in Moscow around 2000 and is currently in use in hundreds of hospitals and clinics in Russia and Eastern Europe. The PLASON produces medical grade NO from ambient air by oxidizing the air stream in a plume of thermal plasma. The PLASON device delivers exogenous NO to affected tissue, either to an open wound or to joints and connective tissues through healthy skin. The exogenous NO mediates healing by (1) increasing blood flow immediately to the affected area, (2) super-charging the innate immune system and (3) stimulating the synthesis of endogenous NO by the body. The exogenous NO rapidly disappears (less than 1 minute) from the tissue to which it is applied, after stimulating blood flow and pathogen cytotoxicity, and is replaced by endogenous NO from the body. It is this endogenous NO which actually does the healing. This website <http://onkocet.eu/en/produkty-detail/35/1/> contains technical information on the PLASON, and under the "PLASON – NO Therapy" tab shows clinical results of human trials in Russia. This link <http://www.onkocet.eu/download/Plason-Abstracts.pdf> is to a series of abstracts on peer-reviewed research into the beneficial effects of gaseous nitric oxide in wound healing.

Beta Trial Findings

The PLASON device required very little training in its use and can be easily employed by technicians to administer effective therapy after a few minutes training, freeing the veterinarians to attend to more technical clinical procedures. VCA Oso Creek Animal Hospital veterinarians and technicians used the PLASON on six documented cases involving traumatic wounds which either did not respond well, or would not have been expected to respond well, to normal procedures and pharmaceutical therapy. In all cases, wound healing was much faster than normal and the outcomes were very satisfactory, especially considering the seriousness of the wounds. The simple application of NO from the PLASON in sessions of 5-10 minutes effected remarkable healing results and offers significant new revenue opportunities.

Revenue Projections

Based on historical procedure frequency and actual therapeutic application in the beta trial, VCA Oso Creek Animal Hospital conservatively projects the following annual revenues in its small animal practice:

Procedure Category	Historical Incident Frequency/Yr	Projected Fee/Procedure	Projected Revenues/Yr
Elective Post-Operative PLASON Therapy	300	\$15.00	\$4,500.00
Non-Elective Post-Operative PLASON Therapy	400	\$25.00	\$10,000.00
Single-Application PLASON Therapy	100	\$45.00	\$4,500.00
Multi-Treatment Minor Wound PLASON Therapy	50	\$175.00	\$8,750.00
Multi-Treatment Major Wound PLASON Therapy	10	\$275.00	\$2,750.00
			<u>\$30,500.00</u>

Case Study #1: "Yoda" Gates

(2-Yr old, DLH, neutered male)

2/1/10

- Presented for wounds from dog attack
- Severe laceration on ventrum, bruising in inguinal area, hypothermic, pulmonary contusions
- Large ruptured abscess on ventral thorax
- Waiting for patient to stabilize and determine if more problems before repairing wounds

2/5/10

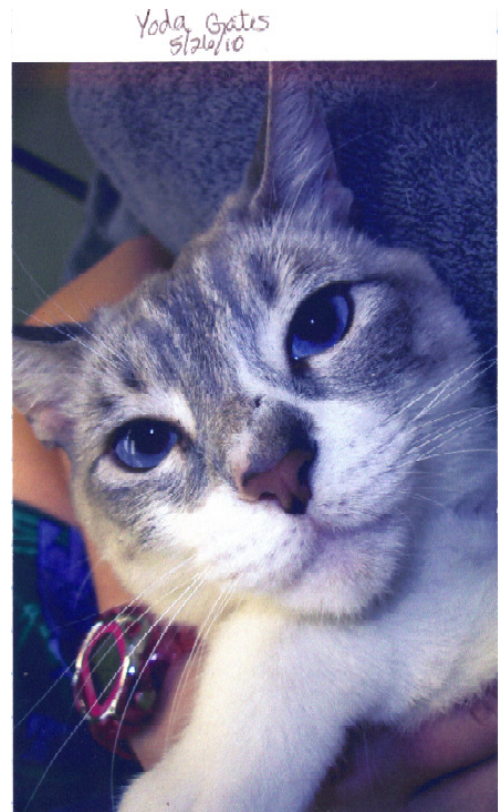
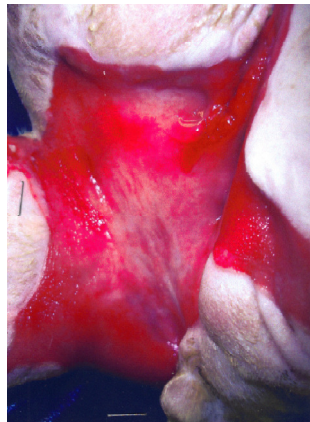
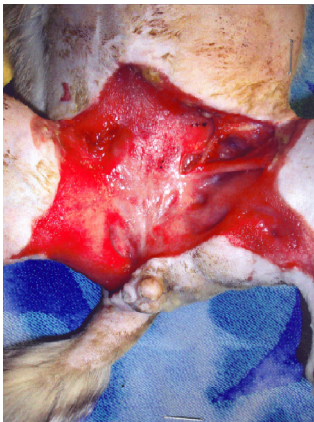
- Debrided necrotic tissue, undermined skin as needed to provide closure

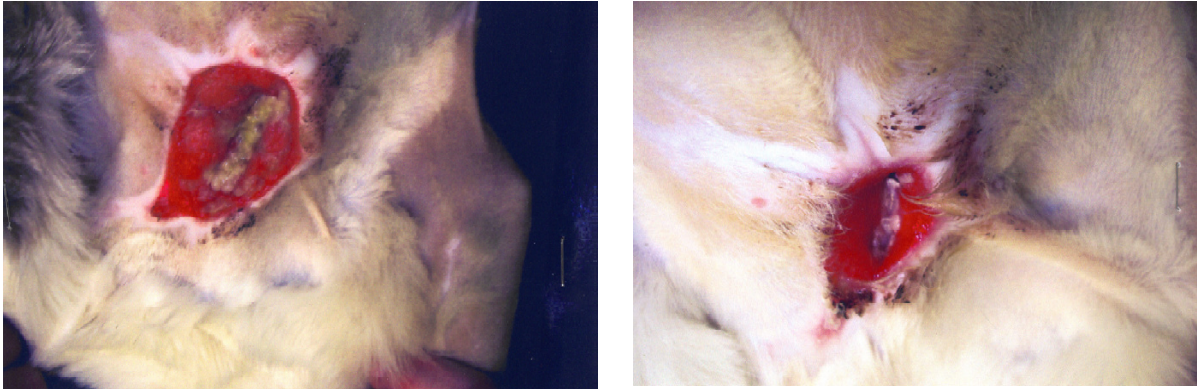
2/14/10

- Yoda was septic and anemic (condition persisted entire 1st month)
- Feeding tube placed
- Yoda was having problems with urination and defecation, urinary catheter placed
- Yoda was placed on Clavamox, Zeniquin & Doxycycline for several weeks, then changed to Cefazolin and Baytril with Doxycyclene

2/25/10

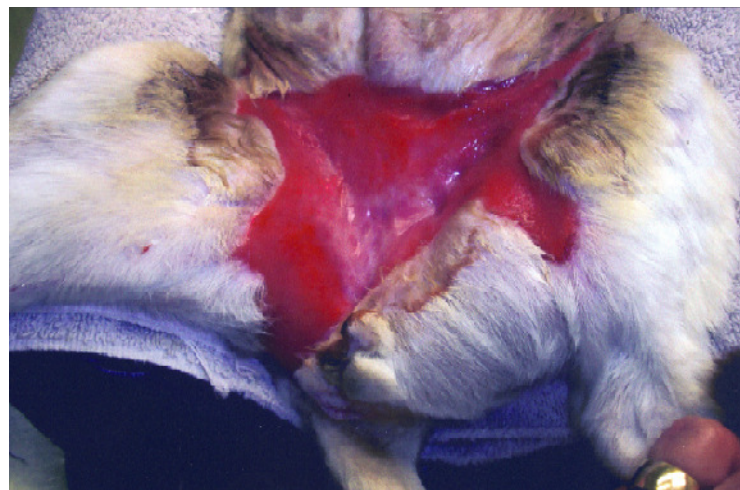
- Yoda developed enterococcus infection that was sensitive to Gentamicin
- Began Nitric Oxide (NO) therapy with Plason unit instead of Gentamicin
- Yoda began to improve, began eating, urinating and defecating on his own.





Images of wound on ventral thorax

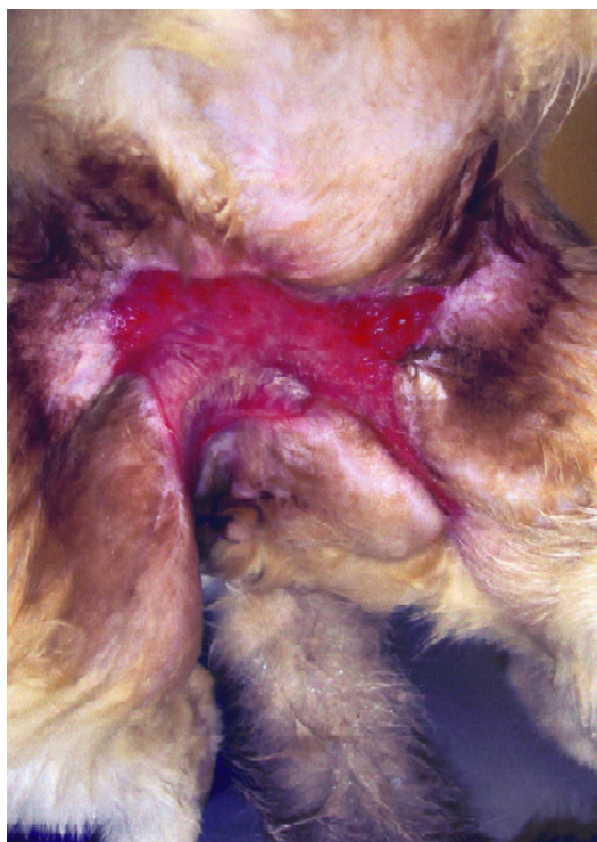
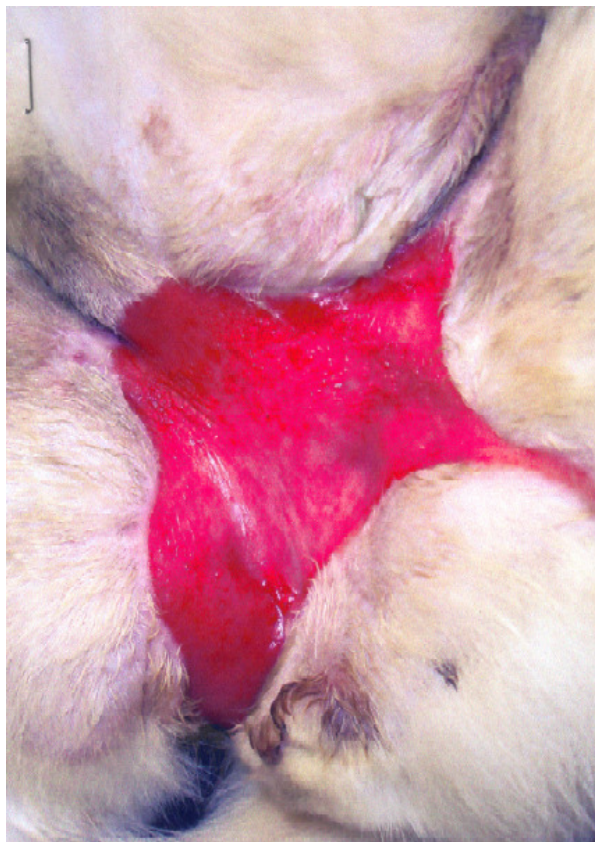
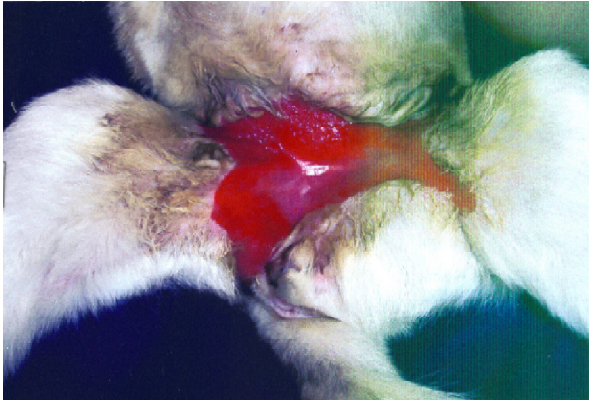
- We were giving NO therapy with the Plason unit, 5 minutes on the abdominal wound and 2 minutes on the thoracic wound for 5 days on and 2 days off for the first month, then changed to 5 days on and 5 days off. Yoda did not do as well with this protocol.
- While on the 5x5 protocol Yoda developed a MRSA infection. We went back to the 5x2 protocol and the MRSA infection cleared up with the Plason NO therapy and Amikacin.



Images of wounds on 4/5/10

Images of wounds on 4/23/10

- Note the healed condition of the ventral thorax wound at right.
- The abdominal wound continues healing and closure.

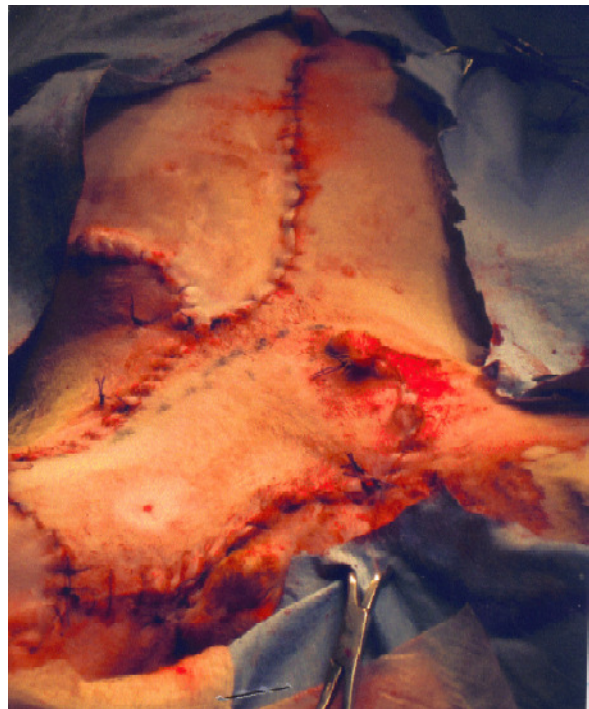
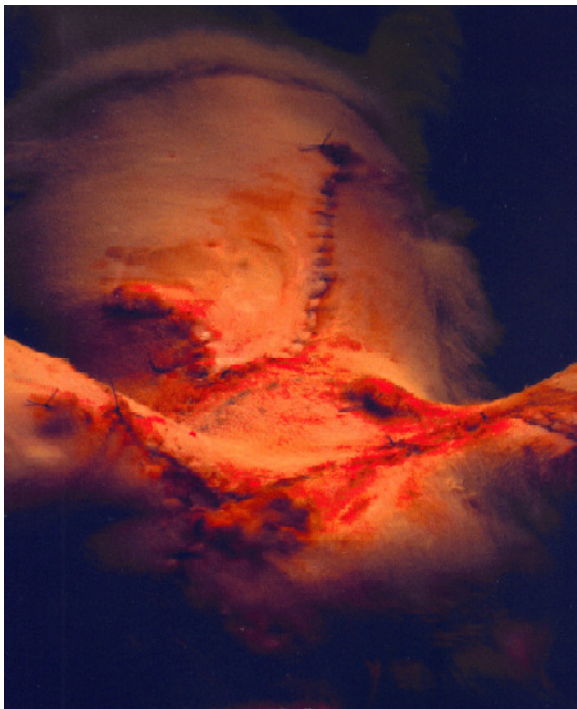
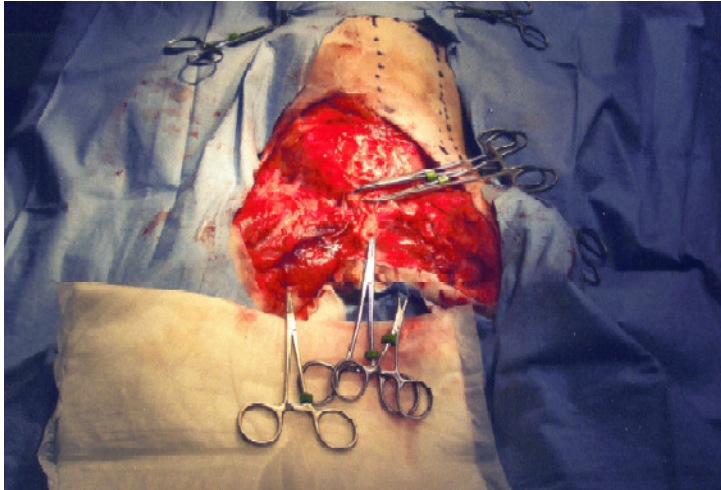


Abdominal wound on 5/26/10

Abdominal wound on 7/16/10

8/9/10

- Prior to surgery legs are constricted and mobility limited due to scar contracture
- Surgery was performed to remove scar tissue and debridement of wound edges and dermal flap performed to increase mobility of legs



- After resecting scar tissue and performing dermal flap

Case Study #2: “Andy” Kuntz

(8½ -Yr old, intact male Rat Terrier)

4/3/10

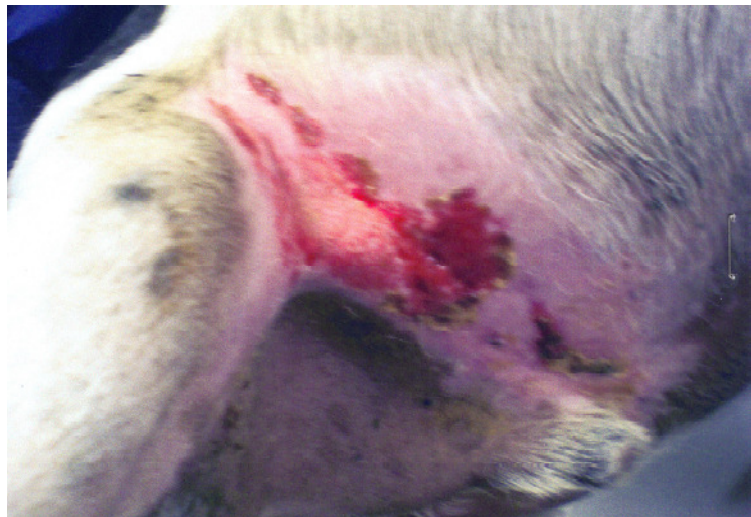
- Presented with wounds from being hit by car
- Had open fracture of right ulna/radius and deep “road rash” in inguinal area

4/16/10

- Plason NO therapy initiated on inguinal area, performed four consecutive days at 5 minutes each. Wound healed very well.

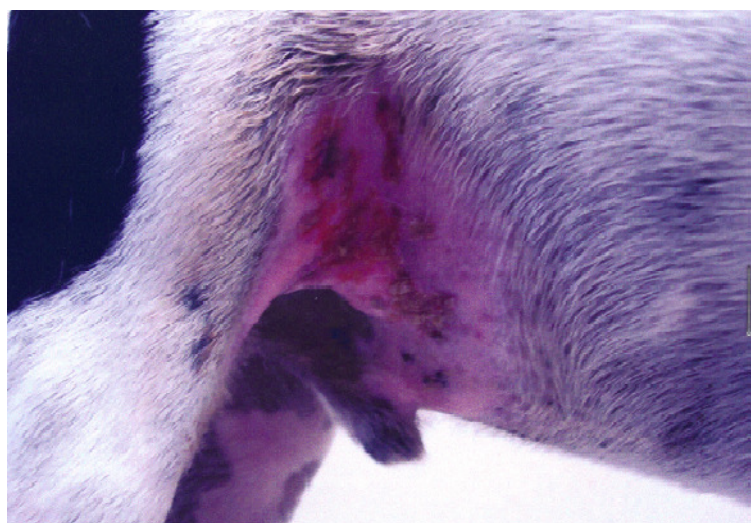
Wound on 4/16/10

Prior to Plason NO therapy



Wound on 4/19/10

Following Plason NO therapy



Case Study #3: “Cody” Clements
(10½ -Yr old, neutered male Chihuahua mix)

2/10/10

- Presented with severe wounds from dog attack
- Degloving injury of the lower/caudal half of his body
- Wound was debrided of devitalized skin, as well as inflamed/contaminated fatty tissue & subcutis
- Skin was undermined so closure could be achieved

2/18/10

- Presented with 3” x 4” section of skin necrosed/dehiscing at right flank area
- Divided skin and exudates; placed tacking sutures at skin edges after freshening granulation bed with #10 scalpel blade.
- Owner applying 5-10 minutes of hydrotherapy daily and Carravet Gel afterwards

2/25/10

- Granulation bed formed with minimal discharge.
- Administered 1st Plason NO therapy treatment for 5 minutes over affected area



3/4/10

- Administered 2nd Plason NO therapy treatment for 5 minutes over affected area



3/11/10

- Administered 3rd Plason NO therapy treatment for 5 minutes over affected area



3/18/10

- Administered 4th Plason NO therapy treatment for 5 minutes over affected area

3/25/10

- Administered 5th Plason NO therapy treatment for 5 minutes over affected area
- Very good wound contraction and granulation



Case Study #4: “Two-Tone” Tschoepe
(Intact male Pit Bull, age unknown, was a stray)

3/23/10

- Presented for wounds and Adverse Drug Reaction
- Severely anemic, emaciated body condition
- Fleas, hookworms & heartworms
- Open wound (ruptured abscess) on right side of neck, about 6” diameter
- Began treatments of Plason NO therapy using cold side of NO discharge in order to get inside wound.
- Also used cold side NO on wound surface
- Therapy applied for 5 minutes.



3/26/10

- Administered 5 minutes of cold side Plason NO therapy to affected area



3/29/10

- Administered 5 minutes of cold side Plason NO therapy to affected area



4/5/10

- Administered 5 minutes of cold side Plason NO therapy to affected area
- Overall, 6 Plason NO therapy sessions of 5 minutes each using the cold side of the Plason NO discharge were applied
- Wound healed remarkably well, especially considering his total body condition



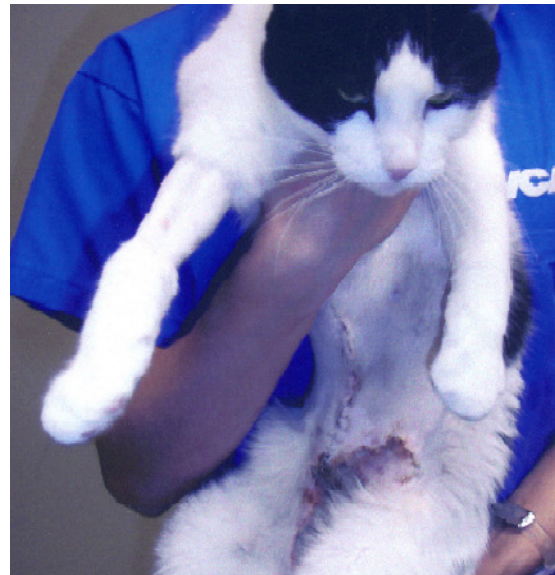
Case Study #5: “Kitty Baby” Whitehead
(1-Yr old, DSH, male)

4/22/10

- Presented to hospital – patient had been missing for 4 days. Had been hit by a car; attacked by a dog; very lethargic; bladder very distended; bruised abdomen; superficial lacerations on rear legs; firm mass palpated on right abdominal/thoracic wall.
- Peritoneal hernia and diaphragmatic hernia
- Hernias repaired surgically; multiple areas of tissue damage; expect possible dehiscence

5/3/10

- Tissues necrosed caudal to ventral abdomen incision line
- Seroma formed caudal/lateral left to necrotic tissue
- Began Plason NO therapy, applying 5 minutes warm side NO to affected area



5/4/10

- Aspirated seroma, applied 5 minutes warm side NO with Plason unit

5/5/10

- Applied 5 minutes warm side NO with Plason unit

5/6/10

- Applied 5 minutes warm side NO with Plason unit

5/7/10

- Applied 5 minutes warm side NO with Plason unit



5/11/10

- Aspirated seroma, applied 5 minutes warm side NO with Plason unit

5/12/10

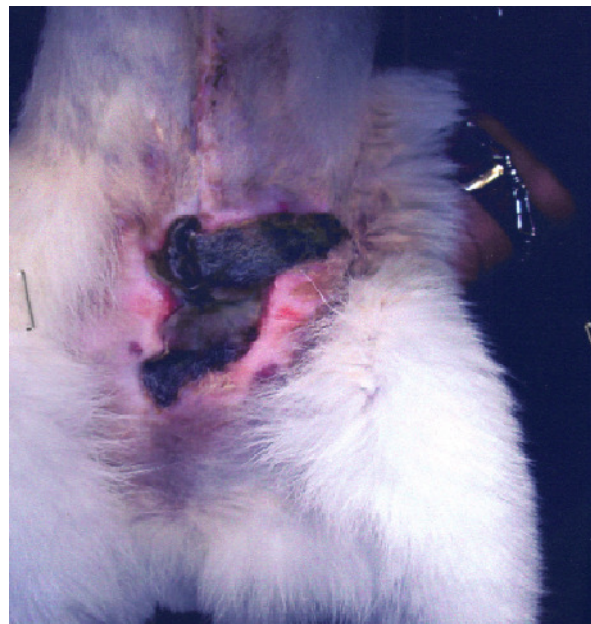
- Applied 5 minutes warm side NO with Plason unit

5/13/10

- Applied 5 minutes warm side NO with Plason unit

5/14/10

- Necrotic tissue begins to slough
- Applied 5 minutes warm side NO with Plason unit



5/17/10

- Manipulated scab off lesion, performed hydrotherapy and manually broke down large seroma under skin
- Applied Plason NO therapy with cold side of NO discharge intralesionally for 5 minutes



5/18/10

- Applied Plason NO therapy with cold side of NO discharge intralesionally for 5 minutes, and then applied 5 minutes with warm side externally

5/19/10

- Applied Plason NO therapy with cold side of NO discharge intralesionally for 5 minutes
- Image at right is after two treatments of cold side Plason NO therapy intralesionally



5/20/10

- Applied Plason NO therapy with cold side of NO discharge intralesionally for 5 minutes

5/21/10

- Applied Plason NO therapy with cold side of NO discharge intralesionally for 5 minutes
- Debrided small amount of necrotic tissue

5/24/10

- Applied Plason NO therapy with cold side of NO discharge intralesionally for 5 minutes

5/25/10

- Applied Plason NO therapy with cold side of NO discharge intralesionally for 5 minutes
- Wound healing well, lesion decreasing in size and depth



5/27/10

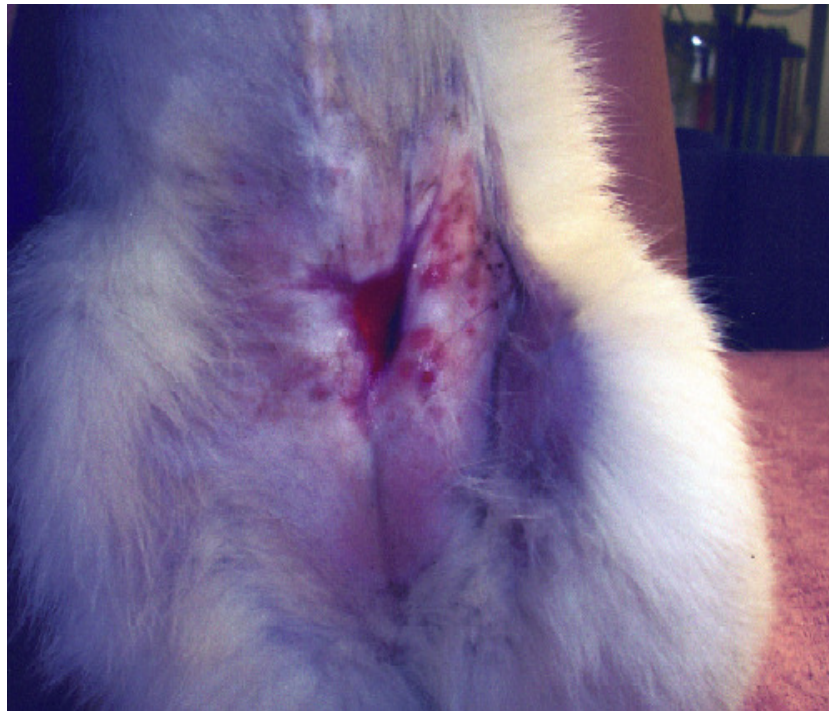
- Applied Plason NO therapy with cold side of NO discharge intralesionally for 5 minutes

5/28/10

- Applied Plason NO therapy with cold side of NO discharge intralesionally for 5 minutes

6/1/10

- Seroma reformed under left side of wound, aspirated 55 ML serum
- Applied 5 minutes warm side NO with Plason unit
- Wound healing well



Case Study #6: "Margaret" Hallam

(2 ½ -Yr old, female (sp), DSH)

6/13/10

- Presented with severe open wound on right rear leg, possible ruptured abscess, necrotic
- Wound began in right rear pelvis area, extended down the medial aspect of the right rear leg to the medial metatarsal area
- Several days later, wound opened on lateral right thigh
- Wound was cleaned / hydrotherapy administered; Convenia injection given; began Zeniquin and applied SSD Cream
- SSD Cream applied for 30 days, Zeniquin given for 30 days
- Began Plason NO therapy treatment 5 days on, 2 days off using warm side NO discharge, continued until 8/9/10



8/19/10

Caudal Rear Leg



8/19/10

Medial Thigh

